

# Kelp! I Need Some Algae

## Kelp Hatchery Innovation

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## Background & Innovation

- Current hatchery culturing protocols are not adapted for Alaska's ecotypes, environmental conditions and state regulations.
- Industry standard Cremona seed string increases waste, labor costs and releases marine microplastics into the oceans and direct seeding is not viable in AK.
- Cost prohibitive fertilizer and obtaining internationally made seed string restrict AK farming operations.

**Our goal is to determine cost-effective ways to reduce hatchery expenses by testing novel natural seed twine options and fertilizers to expand diversity in AK mariculture.**

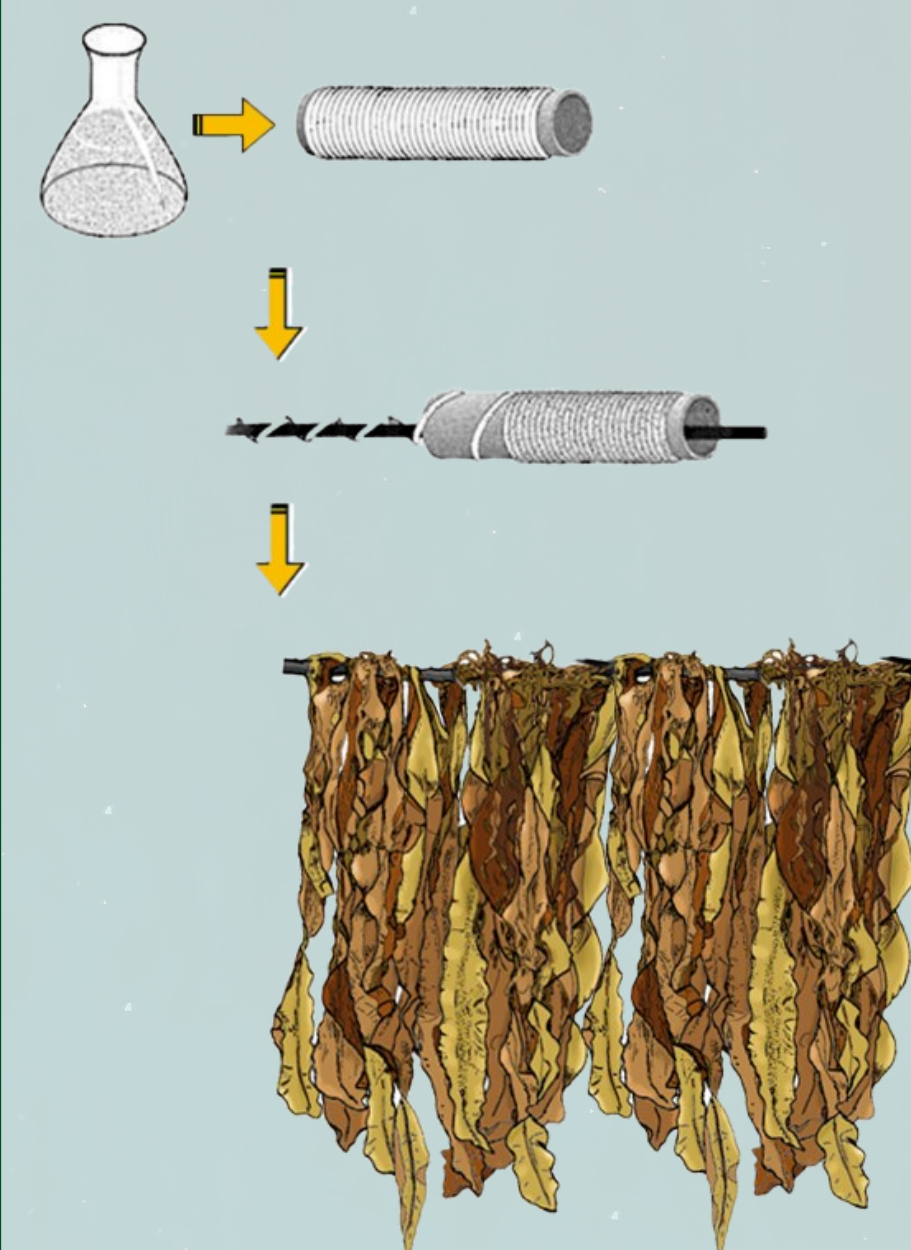


Figure 3: Hatchery methods for deploying longlines

## Materials & Methods

*S. latissima* grown under standard hatchery procedures.

Five replicates per treatments with 12 treatments total.

**Natural fibers** : braided cotton, cotton twine, hemp cord, silk, wool and sisal.

**Fertilizers**: F/2, Jack's 25-5-15 with iron and Provasoli's Enriched Seawater (PES) with iron.

**To assess treatment viability:**

One-meter sections of all treatment replicates were outplanted on four identical longlines at Coghlan Island.

Three largest individuals per replicate were measured as weather permitted.

All lines will be harvested at the end of the growing season and the densities and yield per meter will be measured.

## Preliminary Results

- Seeding in October and outplanting of all four identical longlines in December.
- Outplanted natural fibers are degrading as expected, juvenile blades are stepping off of longlines as of early March.
- Fertilizer longlines remain in the field with all treatments growing well with little biofouling.

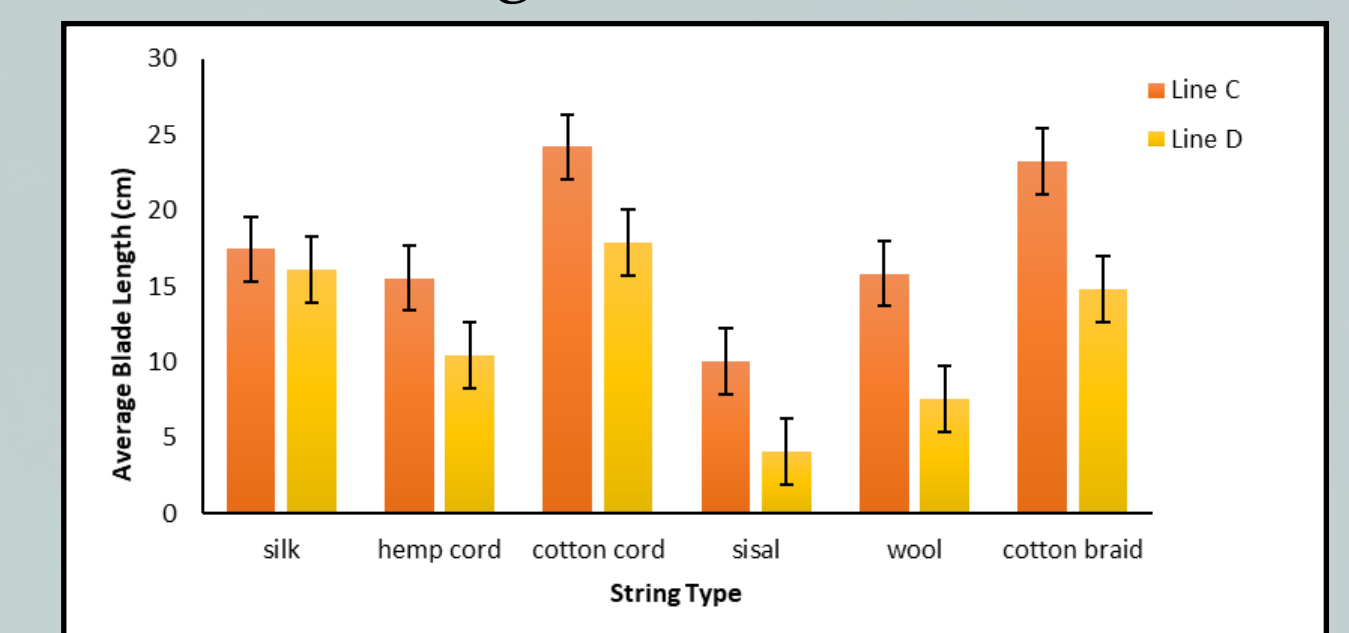


Figure 4: Initial measure of fiber experiment.

## Goals

- Identify an inexpensive, readily available natural fiber that will biodegrade after adequate holdfast development in field trials.
- Compare fertilizer options for hatchery stage to determine if inexpensive and premade fertilizers perform comparably to the industry standard (PES).



Figure 1: Dr. Stekoll



Figure 2: *S. latissima* longline.



## Next Steps

- Continue measurements until harvest in May 2023.
- Determine which natural fibers are viable for industry.
- Determine viable options for cost effective fertilizers, based on concentration and product.
- Final results will help progress development of hatchery technology and adaptation for commercial operations, and reduce plastic waste.



Figure 5: *S. latissima* holdfasts at harvest.